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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/531,003	06/01/2005	Johan Sundstrom	551-002-2	9107
4955 7590 01/10/2007 WARE FRESSOLA VAN DER SLUYS & ADOLPHSON, LLP BRADFORD GREEN, BUILDING 5 755 MAIN STREET, P O BOX 224 MONROE, CT 06468			EXAMINER MCNELIS, KATHLEEN A	
			ART UNIT 1742	PAPER NUMBER
SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE		
3 MONTHS	01/10/2007	PAPER		

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary

Application No.

10/531,003

Applicant(s)

SUNDSTROM, JOHAN

Examiner

Kathleen A. McNelis

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 13 November 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 30-78 is/are pending in the application.
- 4a) Of the above claim(s) 57-78 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 30-56 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date 04/12/2005.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____.

Claims Status

Claims 30-78 remain for examination wherein claims 57-78 are withdrawn.

DETAILED ACTION

Election/Restrictions

Claims 57-78¹ are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected Group, there being no allowable generic or linking claim. Election was made **without** traverse in the reply filed on 11/13/2006.

Claim Rejections - 35 USC § 102

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 30-33, 36, 38, 40, 41, 48 and 56 are rejected under 35 U.S.C. 102(b) as being anticipated by Great Britain patent 922,955 (GB '955).

With respect to claims 30, 31 and 56, GB '955 discloses a method for producing high purity pulverized iron-based powder by nitrating thin steel scrap in the presence of ammonia gas, pulverizing the nitrated steel to a desired particle size and denitrating the pulverized product (p. 1 lines 75-82) to obtain a powder (p. 2 lines 1-13), where steel scrap is an iron based, fragmented raw material.

With respect to claim 32, GB '955 discloses an example where the nitriding is performed at 750 °C (p. 2 lines 20-33), which is within the range of 400 to 800 °C.

With respect to claim 33, GB '955 discloses an example where the nitriding is performed at 700°C (p. 2 lines 34-48), which is within the range of 500 to 700 °C.

¹ Restriction requirement based groupings upon originally submitted claims 1-29. Group II, a plant for manufacturing iron or steel powder (original claims 15-25) corresponds to new claims 57-78.

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With respect to claim 36, GB '955 discloses production of powder size -100 mesh (p. 2 lines 20-44) (i.e. < 0.15 mm), which is within the claimed range of micron size (i.e. < 150 μ m).

With respect to claim 38, GB '955 discloses examples of batchwise treatment (p. 2 line 20-44).

With respect to claims 40 and 41, GB '955 discloses sieving to -100 mesh (p. 2 line 20-44), which separates particles of a desired particle size interval.

With respect to claim 48, GB '955 discloses the use of hydrogen for denitrifying gas (p. 1 lines 9-20).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 34 and 35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Great Britain patent 922,955 (GB '955) alone or in further view of Japanese patent 55-164019 (JP '019).

GB '955 is applied as discussed above regarding claim 30.

With respect to claims 34 and 35, while GB '955 does not recite that the nitridic material has a nitrogen content of about 3 to 20% (claim 34) or more than 6% (claim 35), such would be expected since the process of nitriding steel with ammonia is essentially the same as the invention recited in instant claims 30 and 31, and since operating temperatures disclosed by GB '955 are within ranges in instant claims 32 and 33.

Alternatively, GB '955 does not recite that the nitridic material has a nitrogen content of about 3 to 20% (claim 34) or more than 6% (claim 35).

JP '019 discloses a method for producing a nitrided iron powder by reducing iron powder in a furnace and heating in the presence of ammonia to obtain a product of 1.0 to 10.5 wt% N. Since the method and operating temperatures of JP '019 is similar to that of GB '955, one of ordinary skill in the art would expect similar results. The range of 1.0 to 10.5 wt% overlaps the claimed ranges of 3 to 20% (claim 34) or more than 6% (claim 35), therefore a prima facie case of obviousness exists (M.P.E.P § 2144.05).

Claim 37 is rejected under 35 U.S.C. 103(a) as being unpatentable over Great Britain patent 922,955 (GB '955) in view of Carey et al. (U.S. Pat. No. 4,154,608).

GB '955 is applied as set forth regarding claims 30 and 36 above.

GB '955 does not disclose that milling is preformed using a ball or jet mill as in instant claim 37.

Carey et al. discloses a method for producing high purity iron powder (abstract) wherein the powder is ground to desired size using conventional grinding equipment such as a ball mill which enables the operator to adjust the particle size to any mesh (col. 5 lines 1-11). It would

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have been obvious to one of ordinary skill in the art at the time the invention was made to use a ball mill as taught by Carey et al. to comminute the material in GB '955 since Carey et al. teaches that this allows to the operator to adjust the particle size to any mesh and is suitable for production of high purity iron.

Claims 39, 42, 49, 50, 51 and 52 are rejected under 35 U.S.C. 103(a) as being unpatentable over Great Britain patent 922,955 (GB '955).

GB '955 is applied as discussed above regarding claims 30, 40 and 48.

With respect to claim 39 GB '955 discloses examples of batchwise production as discussed above regarding claim 38. Making a process a continuous is prima facie obvious in the light of a batch process taught by prior art (see M.P.E.P. 2144.04 (V) (E)).

With respect to claim 42, although not recited in GB '955, one of ordinary skill in the art would expect that the milling (i.e. pulverizing) and separation (i.e. sieving) steps are performed dry, since GB '955 does not teach the addition of liquid and further because sieving produces a powder.

With respect to claims 49 and 50, GB '955 discloses denitrifying at a temperature of above 700 °C (p. 2 lines 1-14) which is above the ranges claimed in the instant invention. However, evidence has not been provided in the instant disclosure regarding the criticality of the denitrifying temperature of 250 to 400 °C (claim 49) or 300 to 350 °C (claim 50). It is well settled that where the principal difference between a claimed process and that taught by reference is a temperature difference, it is incumbent upon applicants to establish the criticality of that difference (Ex parte Khusid, et al., 174 USPQ 59).

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With respect to claims 51 and 52, GB '955 discloses pulverizing and sieving to produce a powder sized -100 mesh as discussed above regarding claim 30. The range of -100 mesh (i.e. < 150 μm) overlaps the claimed range of 1 to 50 μm (claim 51) and 3 to 25 μm (claim 52). It would have been obvious to one of ordinary skill in the art at the time the invention was made to produce powders of 1 to 50 μm or 3 to 25 μm in view of the broader disclosed range of < 150 μm .

Claim 43 is rejected under 35 U.S.C. 103(a) as being unpatentable over Great Britain patent 922,955 (GB '955) in view of Muller et al. (1999).

GB '955 is applied as set forth regarding claims 30 and 40 above.

GB '955 does not disclose that milling is preformed using wet milling as in instant claim 43.

Muller et al. teaches that wet mill-classifier circuits have been developed which reduces size distribution of the product and especially the coarse material can be reduced (p. 10). It would have been obvious to one of ordinary skill in the art at the time the invention was made to use wet milling as taught by Muller et al. in the process of GB '955 to reduce size distribution of the product and reduce coarse material as taught by Muller et al.

Claim 44 is rejected under 35 U.S.C. 103(a) as being unpatentable over Great Britain patent 922,955 (GB '955) in view of Carey et al. (U.S. Pat. No. 4,154,608) and Muller et al. (1999).

GB '955 is applied as set forth regarding claims 30 and 40 above.

GB '955 in view of Carey et al. is applied as set forth regarding claim 37.

GB '955 in view of Carey et al. does not disclose recirculation of coarse particles from the separation step to the transformation step.

Muller et al. teaches that in processes where grinding is used in combination with classification, coarse particles are returned to the feed (section 4.2, paragraph bridging pp. 9-10). It would have been obvious to one of ordinary skill in the art at the time the invention was made to return coarse particles as taught by Muller et al. from the sieving process of GB '955 in view of Carey et al., to the feed as taught by Muller et al. for the obvious reason of not wasting materials. Further, it would have been obvious to one of ordinary skill in the art at the time the invention was made to return the coarse materials to nitriding step before milling, since GB '955 teaches that the nitriding step embrittles the material allowing subsequent size reduction (p. 1 lines 1-20).

Claims 45 and 46 are rejected under 35 U.S.C. 103(a) as being unpatentable over Great Britain patent 922,955 (GB '955) in view of Japanese patent 03-090543 (JP '543) or Japanese patent 55-164019 (JP '019) or Naeser et al. (US Patent No. 3,357,827).

GB '955 is applied as set forth regarding claims 30 and 40 above.

GB '955 does not disclose that a separated fraction is collected for sintering purposes (claim 45) or used as an alloying substance in sintered steel production (claim 46).

JP '019 discloses a method of preparing nitrided iron by heating an iron powder in ammonia gas, and using the sintered product as an additive to molten steel (abstract).

JP '543 discloses a method of manufacturing a sintered alloy steel by nitriding an alloy steel with ammonia gas, then pulverizing, compacting and sintering the powder (abstract).

Naeser et al. teaches that nitrides in alloying steel are advantageous, especially in creating hard wear-resisting surfaces that improve the corrosion resistance of porous sintered parts (col. 1 lines 45-55) and discloses a method for producing nitrided powders (abstract).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to separate a nitrided powder as taught by JP '019 or JP '543 or Naeser et al. as an intermediate product of GB '955, since the use of such powder is known in the art for production of sintered products as taught by JP '019 or JP '543 or Naeser et al. and since such powder is produced as an intermediate product of GB '955.

Claim 47 is rejected under 35 U.S.C. 103(a) as being unpatentable over Great Britain patent 922,955 (GB '955) in view of WO 92/14568 (WO '568).

GB '955 is applied as discussed above regarding claim 30.

GB '955 does not disclose heating and milling in a combined step in a rotating tube furnace.

WO '145 discloses a method of nitriding a solid metal using ammonia in a ball mill at temperatures up to 500 °C (abstract) where the milling of metal powders generates a large number of new rough and reactive surfaces and promotes diffusion of the nitrogen in the metal particles (pp. 9-10). The heated mill is the same as a rotating tube furnace with "milling bodies". It would have been obvious to one of ordinary skill in the art at the time the invention was made to use the nitriding/milling process of WO '145 in the process of GB '955, since the combined process of WO '145 promotes diffusion of nitrogen into the metal which is desired in GB '955.

Claims 53-55 are rejected under 35 U.S.C. 103(a) as being unpatentable over Great Britain patent 922,955 (GB '955) in view of the Metals Handbook Volume 7.

GB '955 is applied as discussed above regarding claim 30.

GB '955 does not teach that the powder is used for injection molding (claim 53) or sintering (claim 54).

The ASM Handbook teaches that injection molding is widely used because of low production costs and ability to create complex shapes. After molding, the powder is sintered. Fine iron powders are suitable for use in injection molding (pp. 355-356). It would have been obvious to use injection molding followed by sintering as taught by the ASM Handbook with the powders of GB '955, since this process creates complex shapes with low production costs as taught by the ASM Handbook, and is suitable for powders such as produced by GB '955. With respect to claim 55, GB '955 discloses steel as discussed above regarding claim 30.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kathleen A. McNelis whose telephone number is 571 272 3554. The examiner can normally be reached on M-F 8:00 AM to 4:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy King can be reached on 571-272-1244. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR

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system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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01/04/2007

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